# Status of Bacteria TMDLs in Kansas

Tom Stiles, Watershed Planning, KDHE

Topeka, KS

# Inventory of Existing TMDLs by Basin

| Year | Basin | TMDLs | Hi Priority | FCB Criteria |
|---|---|---|---|---|
| 1999 | Ks-Low Repub | 29 | 16 | < 900 |
| 2000 | Lower Ark | 11 | 6 | < 900 |
| 2000 | Upper Ark | 7 | 7 | < 900 |
| 2000 | Cimarron | 1 | 0 | < 900 |
| 2001 | Mar. d Cygnes | 3 | 2 | 900/2000 |
| 2001 | Missouri | 5 | 3 | 900/2000 |
| 2002 | Neosho | 9 | 1 | < 2000 |
| 2002 | Verdigris | 5 | 1 | < 2000 |
| 2002 | Walnut | 4 | 2 | < 2000 |
| 2003 | Smoky-Saline | 0 | 0 | 200 GM |
| 2003 | Solomon | 0 | 0 | 200 GM |
| 2003 | Upper Repub. | 0 | 0 | 200 GM |
| Total | Kansas | 74 | 38 | - |

# TMDL Targeted Activities

- 1. CAFOs
- 2. Municipal WWTP
- 3. Grazing Lands
- 4. Riparian Areas
- 5. On-Site Waste
- 6. Background – Domestic
- 7. Background – Wildlife
- Activities within one mile of streams

# TMDL Targeted Delivery Agents

- 1. KDHE – WMS, LWMS, Tech Srv, Muni
- 2. SCC – NPS
- 3. K-State – Watershed Specialists
- 4. NRCS – District Conservationist
- 5. Conservation Districts
- 6. Local Environmental Protection Groups
- 7. Watershed Restoration and Protection Groups

# TMDL Targeted Programs & Practices

- 1. NPDES – WWTP, CAFO, Stormwater
- 2. Section 319 – WRAPS
- 3. SCC – NPS, WRCSP & Buffers
- 4. Farm Bill – EQIP, Buffers, WRP, CREP
- 5. LEPP – On-Site Wastewater
- Milestone: 2/3 of identified activities participating in programs

# Bacteria Criteria History

EPA proposed criteria in 1986

- *Ambient Water Quality Criteria for Bacteria*
- Indicator levels set to protect against GI illness in swimmers
  - Bacteria
  - Protozoa
  - Virus

- Freshwater crit. developed from studies at two beaches
  - Interviewed swimmers who
    - Submerged head
    - Swam for at least 30 minutes
    - Followed up in 7 to 10 days to see if illness
    - Compared illness to bacteria quality

# Switch in Criteria

- Need to switch indicator to use risk-based criteria
- Current indicator – fecal coliform bacteria
  - Data do not support risk being related to illness

**For risk-based criteria, need to use**

***E. Coli* or Enterococci**

**Data support risk based criteria for either**

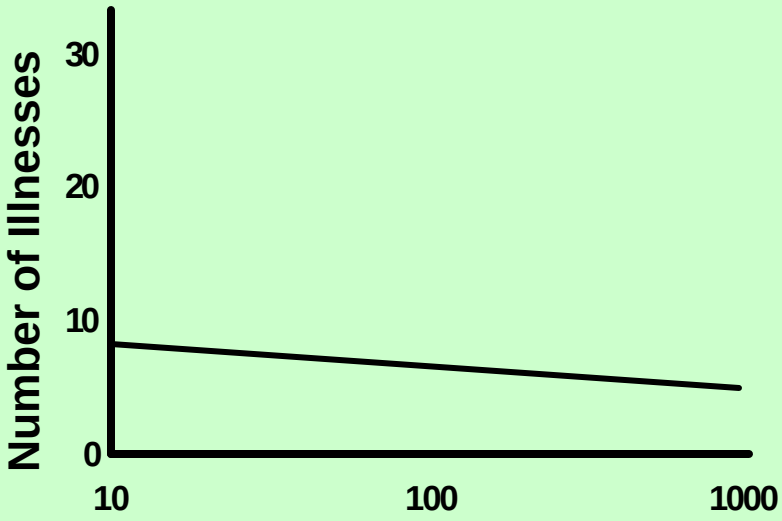
# EPA Recommendations

EPA recommended

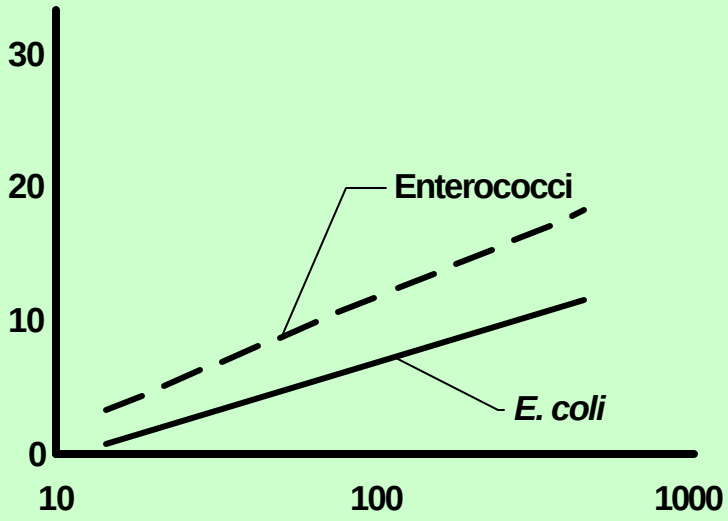
- *E. coli* for freshwater
- Enterococci for marine water

- EPA "required" states to adopt EC or Ent
  - By 2003 or EPA adopt
  - Later backed off
    - Could only require for marine water - Beach Act
    - Still recommend for freshwater
- Why EC or Ent?
  - Better correlation between illness and concn.

# Bacteria Risk Data




**Fecal Coliform Bacteria**
per 100 mL




***E. coli* / Enterococci Bacteria**
per 100 mL

# HB 2219

Main features

- Addresses stream segments – not lakes, ponds, etc.
  - Established new recreational uses
  - Established minimum risk-based levels for new uses
  - Established stream impairment criteria
    - Violation of a geometric mean
      - » 5 samples
      - » 30-day collection period
- Required KDHE to propose implementation regs
  - On or before 7/1/03

# HB 2219 Recreation Uses

- Primary Contact Recreational Use - *swimming*
  - Class A – Swimming beach
  - Class B – Public water, or public access
  - Class C – Private water, no access
- Secondary Contract Recreational Use - *wading*
  - Class A - Public water, or public access
  - Class B – Private water, no access

# Primary Contact Criteria

| | | ***E. coli* Criteria* (cfu/100 mL)** | |
|---|---|---|---|
| **Use** | **Illness Rate (#/1000 swimmer)** | Apr to Oct | Nov to Mar |
| **Class A** | 8 | 160 | 2,358 |
| **Class B** | 10 | 262 | 2,358 |
| **Class C** | 12 | 427 | 3,843 |

# Secondary Contact Criteria

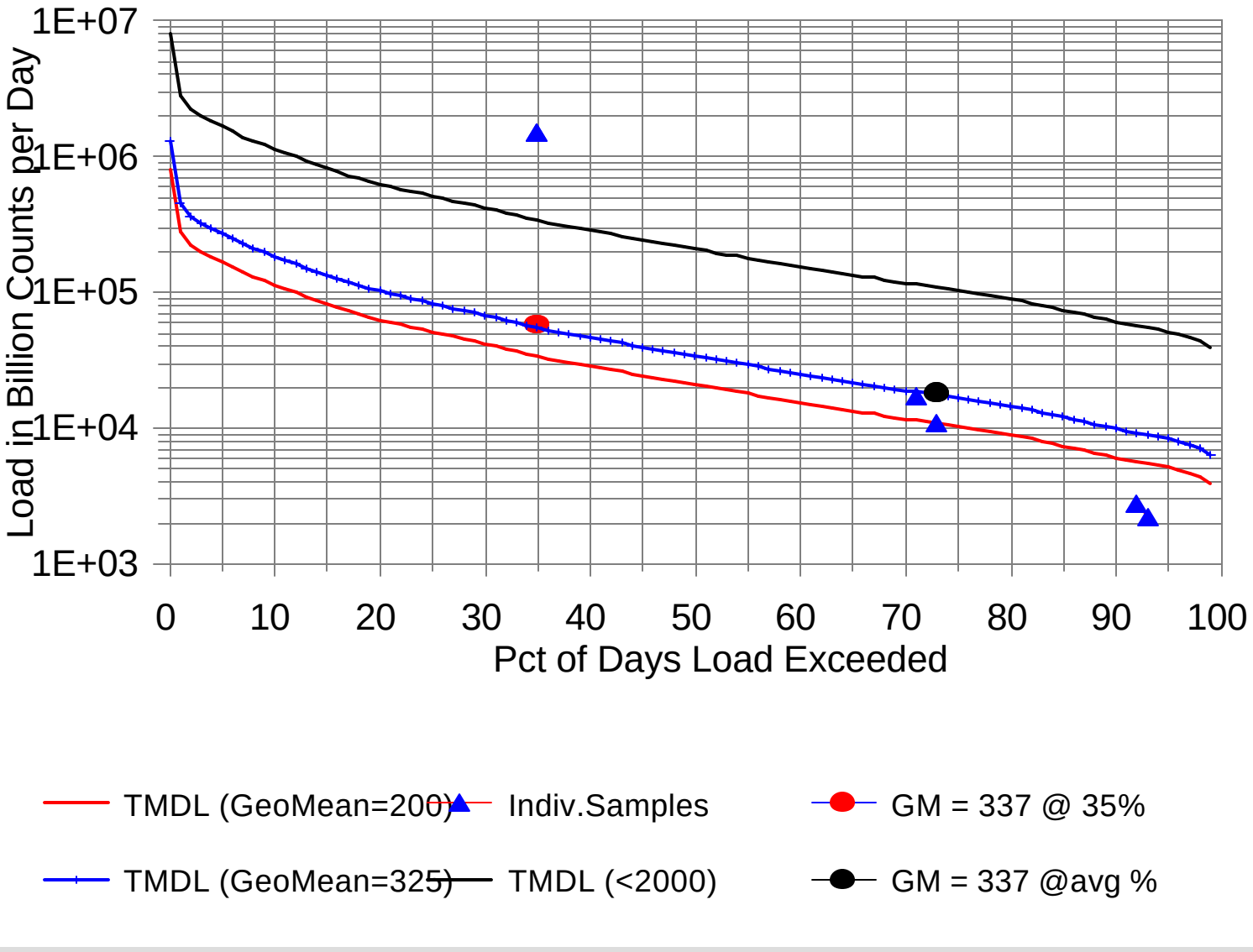
| Use | Basis | Year-round *E. coli* Criteria (cfu/100 mL) |
|---|---|---|
| **Class A** | 9 Times Primary Class B | 9 x 262 = 2,358 |
| **Class B** | 9 Times Primary Class C | 9 x 427 = 3,843 |

# Kansas River near DeSoto- A Geometric Mean Example

| DATE | FCB | FLOW | PCT EXCD |
|---|---|---|---|
| Aug 18 | 100 col/cml | 1140 cfs | 92% |
| Aug 25 | 80 col/cml | 1120 cfs | 93% |
| **Aug 31** | **9000 col/cml** | **6820 cfs** | **35%** |
| Sept 5 | 200 col/cml | 2210 cfs | 73% |
| Sept 14 | 300 col/cml | 2320 cfs | 71% |
| Geo Mean | 337 col/cml | 2138 cfs | 73% |

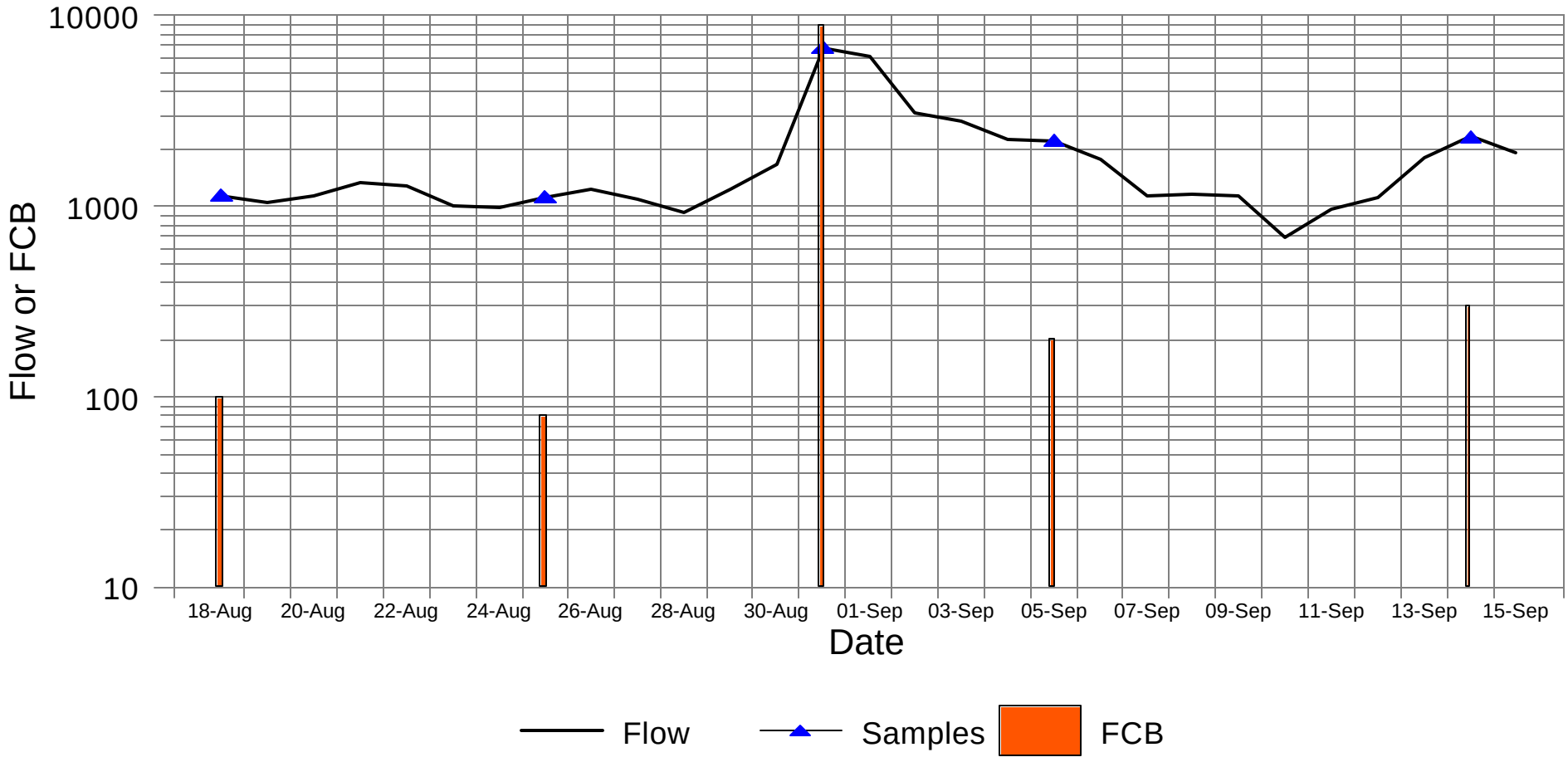
# Bacteria TMDL-Kansas R. - DeSoto

Geo Mean Evaluation (Aug 18-Sept 14)



# Daily Flows and Bacteria

Kansas River nr Desoto (8/18-9/14)

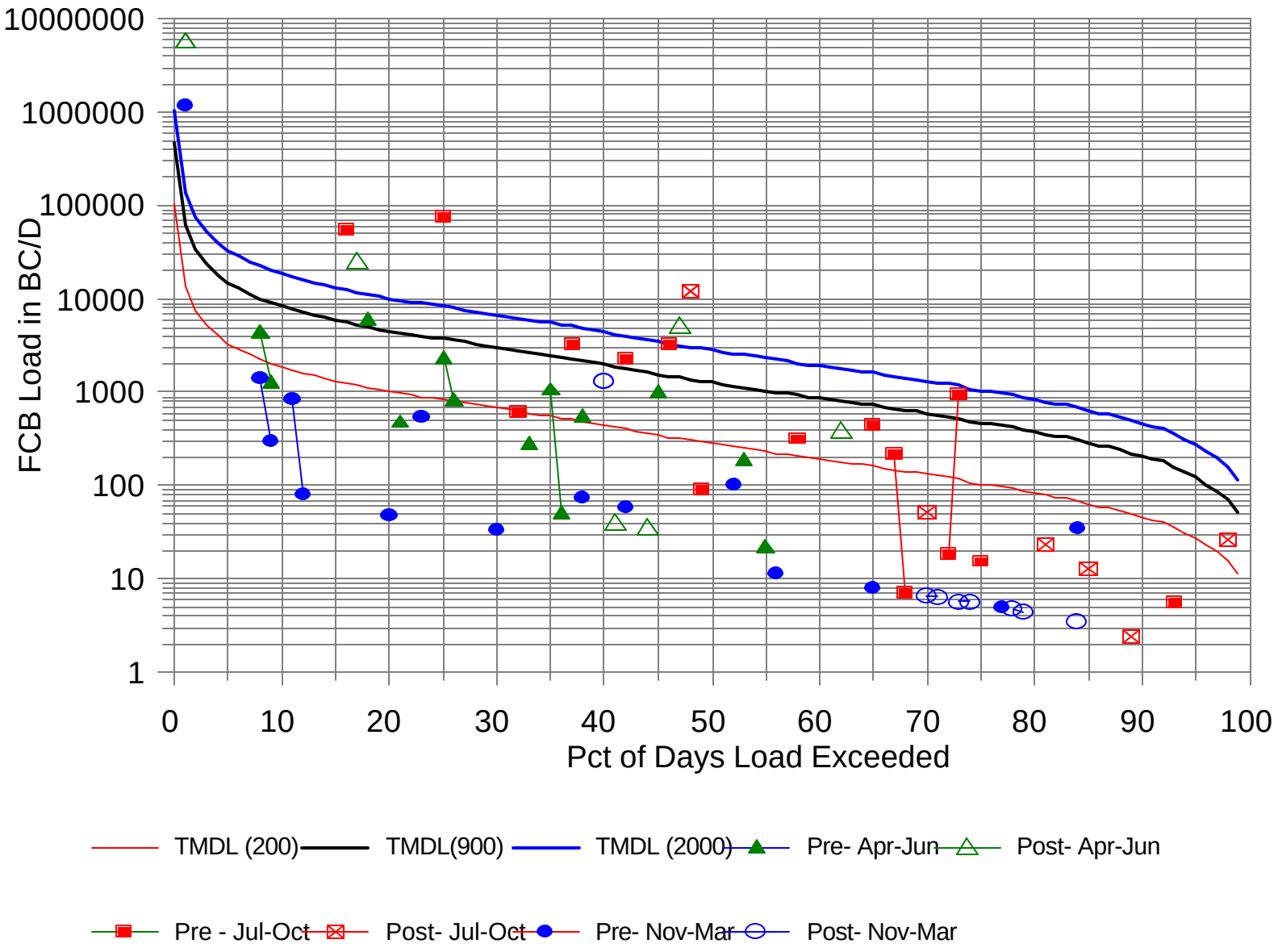


# 2004 Activities

- Return to the Kansas-Lower Republican
- 1. Evaluation of Existing TMDLs
- 2. Revision of Selected Existing TMDLs
- 3. Prepare 2004 303d List by April 1.
- 4. Priority Development of TMDLs for Impairments from 2002 & 2004 303d List

# Mill Creek near Maple Hill FCB TMDL

1990-99 vs 2000-03



# 2004 Bacteria TMDL Priorities

- 1. Stranger Creek (Lv.Co.) – 34% Impairment
- 2. Mill Creek (Jo.Co.) – 23%; Stormwater
- 3. Cedar Creek (Jo.Co.) – 24%; Stormwater
- 4. Wildcat Creek (Rl.Co.) – 17%; D.O.
- 5. Salt Creek (Rp.Co) – 27%; D.O.
- 6. Soldier Creek (Ja.Co) – Tribal/Watershed

# WQS Issues

- Lake, pond, and wetland uses and criteria
  - Weren't addressed by HB 2219
- High flow exception
- Enterococci criteria in saline water
  - What defines a saline water?
- Definition of *E. coli*
- NPDES permit limits
  - Awaiting for wastewater test method - 2005

# TMDL Issues

- 1. Conversion to *E. Coli* Endpoints
- 2. Incorporating Geometric Means
- 3. High Flow Impairments
- 4. Evaluation of Progress by Third Cycle